

ABSTRACT

A liquid crystal display device includes cell wall structure and a chiral nematic liquid crystal material. The cell wall structure and the liquid crystal cooperate to form focal conic and twisted planar textures that are stable in the absence of a field. A device applies an electric field to the liquid crystal for transforming at least a portion of the material to at least one of the focal conic and twisted planar textures. The liquid crystal material has a pitch length effective to reflect radiation having a wavelength in both the visible and the infrared ranges of the electromagnetic spectrum at intensity that is sufficient for viewing by an observer. One liquid crystal material may be disposed in a single region or two or more liquid crystal materials may be used, each in separate regions even without the infrared reflecting layer. One aspect of the invention is directed to a photolithography method for patterning a substrate of the display. The display may also have multicolor capabilities by including separate layers of at least two or three liquid crystal materials that reflect visible light. A full color stacked display may be produced with grey scale capabilities.